MODEL 208

SERVICE DATA SHEET No. 1

CIRCUIT DESCRIPTION

Designed to work on A.C. or D.C. mains from 195—255 volts, the M.208 is a four valve plus rectifier, 2 waveband superheterodyne receiver, employing UCH42, UF41, UBC41, UL41 and UY41, with a high efficiency loop aerial wound on a ferrite rod. The wavebands are M.W.180—550 metres, and L.W.1000—2000 metres. No external aerial or earth connections are provided.

AERIAL

The tuned ferrite rod aerial input, L_1, C_2+C_3 on M.W. and L_1+L_2, C_1, C_2+C_3 on L.W., is fed to the hexode control grid of the triode hexode frequency changer (UCH42).

OSCILLATOR

The oscillator anode coils L4 (LW) and L6 (MW) are untuned, and coupled to L3 (LW) and L5 (MW) which are tuned by C4. On the M.W. adjustment is by C5 (across the gang) and C10 (across the padder C9). On L.W. adjustment is by C6 across the fixed minimum capacitor C7.

I.F. STAGE

The intermediate frequency signal (470 Kc/s) is fed via the permeability tuned I.F. transformer L7, L8 and C11, C12 to V2 the variable-mu I.F. pentode UF41, and thence through the second permeability tuned I.F. transformer L9, L10 and C14, C15 to the signal diode circuit of the double diode triode UBC41, the I.F. filter consisting of C16, R4 and C17.

SECOND DETECTOR, A.F. AND OUTPUT STAGE

The automatic gain control diode is coupled from the signal diode via C21. The automatic gain control voltage is developed across R7 decoupled by R3 and C19, and is applied to the hexode control grid of the frequency changer, and to the control grid of the I.F. valve. The A.F. voltage developed across the potentiometer R5, which is part of the diode load, is fed to the triode grid via C18. The triode grid leak is R6. Cathode bias is developed across R8, by-passed by C20, and is common to the I.F. and double diode triode valves, also supplying a delay voltage for the automatic gain control. The amplified A.F. signal developed across R9 is fed via C22 and R10 to the control grid of the output valve UL41. Automatic bias is supplied by R11. The low impedence loudspeaker is matched to the output valve by T1. Tone correction is by C23.

POWER SUPPLY AND SMOOTHING

The H.T. voltage is supplied by a half wave rectifier UY41 with reservoir capacitor C26. Smoothing for the output valve anode is by R13, C25. R13 is chosen to avoid excessive voltage drop whilst maintaining adequate smoothing. Further smoothing for the main H.T. line is by R12, C24. The heaters of the valves are fed in series through the tapped mains dropper, a surge limiter of 100 ohms for the rectifier anode is included in the dropper, the whole resistor being R14.

The dial bulbs are shunted by resistor R15, so that should the dial bulbs fail, the set will still function. C27 is included to reduce the effect of noise pick-up by the mains supply, which would otherwise find its way into the aerial circuitry by radiation of the wiring.

VOLTAGE MEASUREMENTS

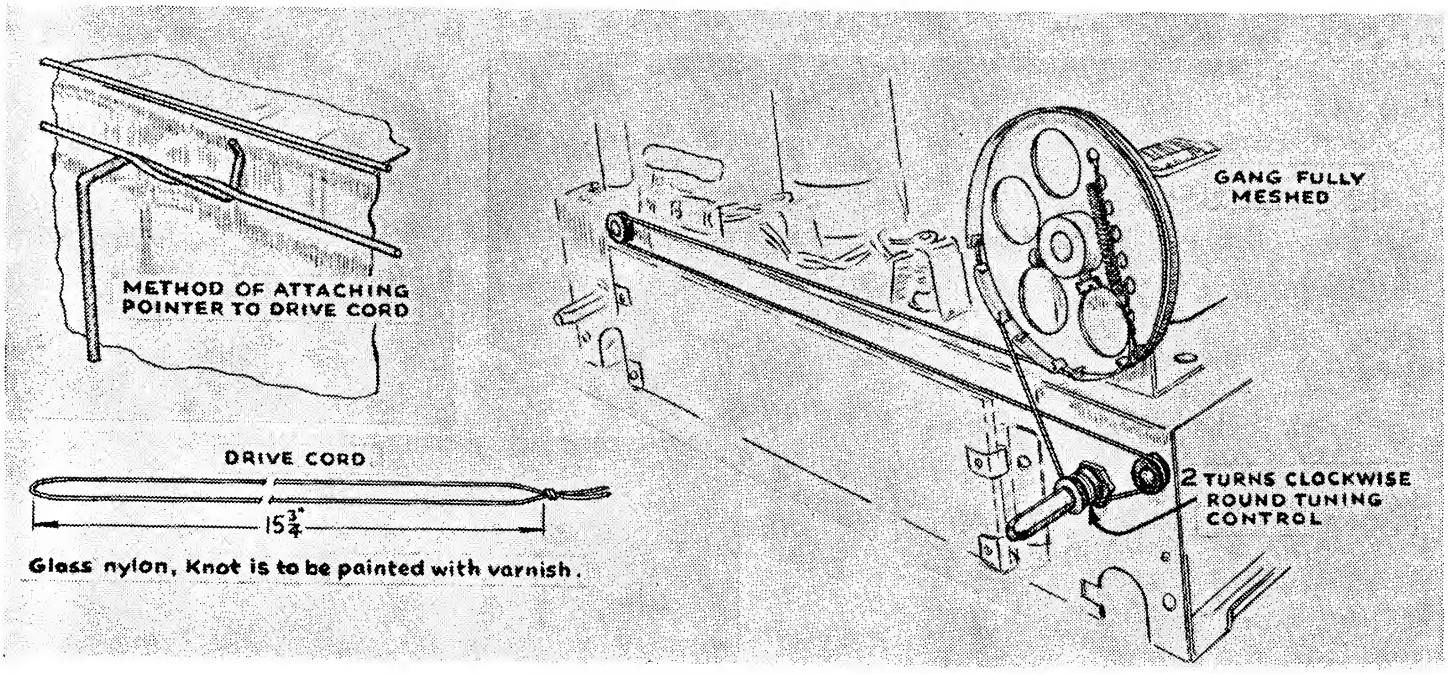
All voltages relative to chassis and D.C. unless otherwise stated. Measurements made with M.7 AVO on 400 v. range unless otherwise stated.

100 v. range indicated thus + 10 v. range as indicated thus = 1 v. range as indicated thus ×

VALVE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
UCH 42	H 25·2 A.C.	AH 144	AT 56+	G3.GT —	G.2.G.4. 67·5	G1 —	K —	H 12·9 A.C.
UF 41	H 38 A.C.	A 144	KS.G3 ·55×	— —	G2 67·5+	G1 —	KS.G3 ·55×	25·2 A.C.
UBC 41	H —	AT 50·6	GT —	— —	AD —	AD —	K ·55×	H 12·9 A.C.
UL 41	79·8 A.C.	A 172	— —	— —	G2 150	G1 —	K 7·85=	38 A.C.
UY 41	107 A.C.	AD 220 A.C.	— —	— —	— —	— —	K 220	79·8 A.C.

Above Voltages for Input of 238 v. A.C. on 236/255 Tap.
Input 250 v. A.C. on 236/255 v. tap for Ripple Current Measurement.
Electrolytic ripple current—99 ma in reservoir (measured on M.I. milliammeter).
Peak Voltage : 253 volts.
Ripple Voltage : 48 volts.
Dial bulbs : 6·3 v. ·115 amp. G.E.C.

DRIVE CORD AND POINTER FITTING



RESISTANCE VALUES

L. No.	DESCRIPTION	Ohms.
L1	L.W. Aerial Loop	3·4
L2	M.W. Aerial Loop	·8
L3	L.W. Osc. Grid Coil	13
L4	L.W. Osc. Coupling Coil	1·7
L5	M.W. Osc. Grid Coil	6·3
L6	M.W. Osc. Coupling Coil	1·2
L7	1st I.F. Transformer Primary	5·35
L8	1st I.F. Transformer Secondary	5·35
L9	2nd I.F. Transformer Primary	5·35
L10	2nd I.F. Transformer Secondary	5·35
T1	L.S. Output Transformer Primary	350
	Sec.	·47
	Loud Speaker Speech Coil	3

FERRITE ROD REMOVAL

The ferrite aerial rod is very brittle and it is recommended that it should be removed before turning the chassis on its back for repairs etc.

The rod is supported on paxolin panels which are clipped to the metal brackets on the chassis by means of two spring clips. These clips are removed by gently squeezing the tongue. The clip will then push through the hole.

It is not necessary to unsolder the leads to the connecting tags, provided care is taken not to stand the chassis on the rod.

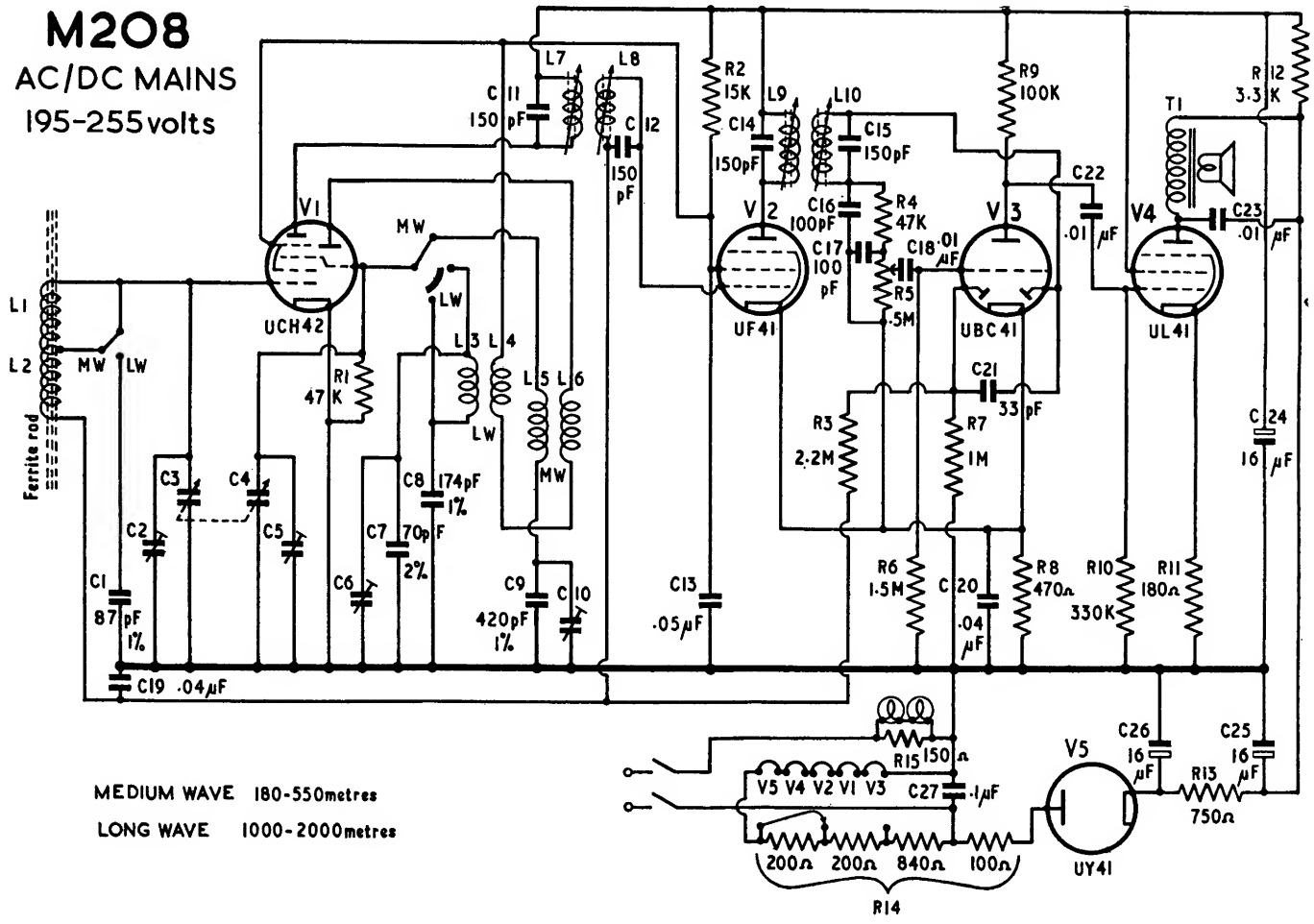
The clips can be replaced by pressing them firmly into the hole. Make sure that the face of the spring clip is pressed well against the paxolin.

CIRCUIT DIAGRAM

M208

AC/DC MAINS

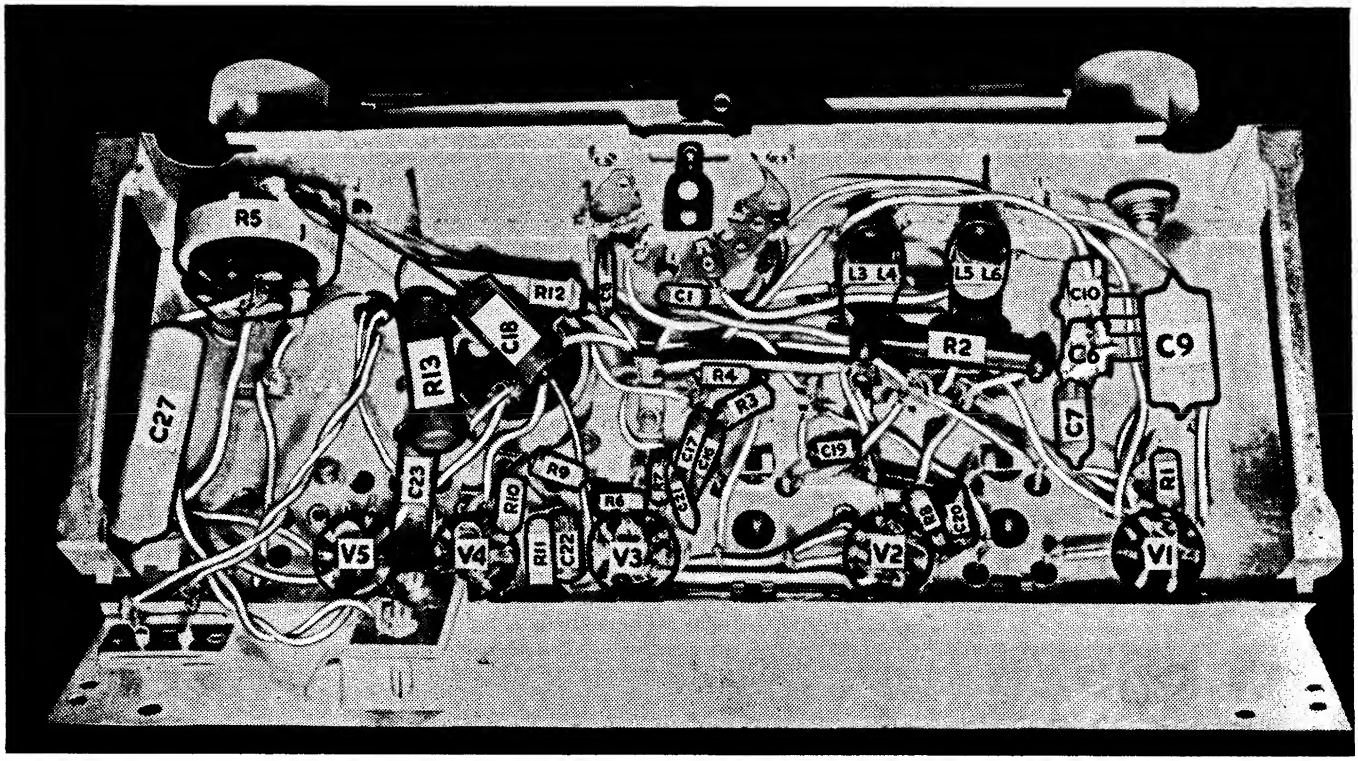
195–255 volts



MEDIUM WAVE 180-550metres

LONG WAVE 1000-2000metres

UNDER CHASSIS



CIRCUIT ALIGNMENT

Equipment required :—
Calibrated signal generator.
Insulated trimming screwdriver.
6 BA Box spanner.
Coupling Loop, see diagram.
A.C. voltmeter across speech coil Terminals.

I.F. ALIGNMENT.

Unscrew both cores on each transformer until they are flush with the ends of the cans.

With the wave change switch to M.W. and the gang fully meshed, apply a 470 Kc/s signal to frequency changer control grid, alternatively the signal may be injected by the single turn loop as used for calibration. Then, using the insulated trimming tool, adjust the cores for maximum output. The following sequence to be used :—

No. 1. Top core 2nd I.F. Transformer.
No. 2. Bottom core 2nd I.F. Transformer.
No. 3. Top core 1st I.F. Transformer.
No. 4. Bottom core 1st I.F. Transformer.

Maintain gain control at maximum, reducing the generator output as circuits come into line to prevent A.V.C. circuit operating.

Repeat No. 1 to No. 4 at least once.

SIGNAL CALIBRATION

Set the pointer to the extreme right-hand dot on the M.W. scale with the gang fully meshed.

MEDIUM WAVE

With wave change switch in M.W. position, set pointer to 200 metres and inject 1500 Kc/s. Set coupling loop to not less than the rod length (i.e. 8″) on the right of the receiver. Tune the 1500 Kc/s signal with C5, then adjust C2 for maximum response.

Inject a signal of 600 Kc/s, adjust the M.W. padder C10 for maximum response whilst rocking the gang. Check that this point coincides with 500 m. on the scale.

Repeat both operations until no improvement can be obtained.

LONG WAVE

With the wave change switch to L.W., inject a signal of 300 Kc/s, set pointer to 1000 metres and tune L.W. oscillator trimmer C6 for maximum response whilst rocking the gang. Check that this point coincides with 1000 metres on the scale.